



## SEQUENCE LISTING

<110> FOWLKES, Dana M.  
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MURPHY, Andrew J.  
PAUL, Jeremy  
TRUEHEART, Joshua

<120> YEAST CELLS ENGINEERED TO PRODUCE PHEROMONE SYSTEM PROTEIN SURROGATES AND USES THEREFOR

<130> CPI-012CP4DV

<140> 09/258600  
<141> 1999-02-26

<150> 08/461598  
<151> 1995-06-05

<150> 08/322137  
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<150> 08/309313  
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<150> 08/190328  
<151> 1994-01-31

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Ile Pro Ala Glu Ala Val Ile Gly Tyr Leu Asp Leu Glu Gly Asp Phe  
35 40 45  
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu  
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65 70 75 80  
Ser Leu Asp Lys Arg Glu Ala Glu Ala  
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Met Tyr Lys Arg Glu Ala Asp Ala Glu Ala Trp His Trp Leu Gln Leu  
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&lt;211&gt; 19

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

&lt;223&gt; Xaa = Any Amino Acid

&lt;400&gt; 7

Lys Arg Glu Ala Glu Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5 10 15  
Xaa Xaa Xaa

&lt;210&gt; 8

&lt;211&gt; 36

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

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Cys Val Ile Ala  
35

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gtgttattgc ttaagtacg 79

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cgtacttaag caataacaca 20

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&lt;212&gt; DNA

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&lt;223&gt; FRAGMENT

&lt;400&gt; 31

gggaaagact tctgccctgc gccgctgctg cc

32

&lt;210&gt; 32

&lt;211&gt; 36

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 32

gggaaagacc cgcaaggaggc agaagcttgg ttgcag

36

&lt;210&gt; 33

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 33

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27

&lt;210&gt; 34

&lt;211&gt; 32

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

&lt;400&gt; 34

Arg Asn Ser Ser Ser Ser Gly Ser Ser Gly Ala Gly Gln Lys Arg Glu

1 5 10 15

Ala Glu Ala Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr

20

25

30

&lt;210&gt; 35

&lt;211&gt; 29

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; FRAGMENT

&lt;400&gt; 35

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<211> 13  
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<213> *Saccharomyces cerevisiae*

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1 5 10

<210> 48  
<211> 39  
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<222> (1) . . . (39)

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Trp His Trp Met Glu Leu Arg Pro Gly Gln Pro Met Tyr  
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1 5 10

33

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<213> *Saccharomyces cerevisiae*

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Leu Met Ser Pro Ser Phe Phe Phe Leu Pro Ala  
1 5 10

33

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<212> PRT  
<213> *Saccharomyces cerevisiae*

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<210> 58  
<211> 27  
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<213> *Saccharomyces cerevisiae*

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27

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<212> DNA  
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23

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26

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<212> DNA

<213> *Saccharomyces cerevisiae*

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ggtgggaggg tgctctctag aaggaagtgt tcacc 35

<210> 63  
<211> 41  
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<213> *Saccharomyces cerevisiae*

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<211> 42  
<212> DNA  
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<210> 71  
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<211> 43  
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<210> 74  
<211> 37  
<212> DNA  
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<210> 75  
<211> 44  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 75  
ctgctggtcg acgcggccgc gcccctcaga agaggccgcg gtcc 44

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<211> 29  
<212> DNA  
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<400> 76  
gggctcgagc ctcagaagag gccgcagtc 29

<210> 77  
<211> 37  
<212> DNA  
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<400> 77  
ctgctggagc tcaagctgt gctactcggt gctggag 37

<210> 78  
<211> 49  
<212> DNA  
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<213> *Saccharomyces cerevisiae*

<400> 80  
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19

<210> 81  
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<212> DNA  
<213> *Saccharomyces cerevisiae*

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23

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<211> 66  
<212> PRT  
<213> *Saccharomyces cerevisiae*

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Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
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Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Ile Lys Leu Leu Leu Gly  
35 40 45  
Ala Gly Glu Ser Gly Lys Ser Thr Val Leu Lys Gln Leu Lys Leu Leu  
50 55 60  
His Gln  
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<211> 65  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 83  
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Lys Ala Gln Arg Glu Ala Asn Lys Lys Ile Glu Lys Gln Leu Gln Lys  
20 25 30  
Asp Lys Gln Val Tyr Arg Ala Thr His Arg Leu Leu Leu Gly Ala  
35 40 45  
Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu His  
50 55 60  
Val  
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<212> PRT  
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<400> 84  
Met Gly Cys Thr Val Ser Ala Glu Asp Lys Ala Ala Ala Glu Arg Ser  
1 5 10 15  
Lys Met Ile Asp Lys Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Arg  
20 25 30  
Glu Val Lys Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr  
35 40 45  
Ile Val Lys Gln Met Lys Ile Ile His Glu  
50 55

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<213> *Saccharomyces cerevisiae*

<400> 85  
Met Gly Cys Thr Val Ser Ala Glu Asp Lys Ala Ala Val Glu Arg Ser  
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Lys Met Ile Asp Arg Asn Leu Arg Glu Asp Gly Glu Lys Ala Ala Lys  
20 25 30  
Glu Val Lys Leu Leu Leu Gly Ala Gly Glu Ser Gly Lys Ser Thr  
35 40 45  
Ile Val Lys Gln Met Lys Ile Ile His Glu  
50 55

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Met Ala Arg Ser Leu Thr Trp Arg Cys Cys Pro Trp Cys Leu Thr Glu  
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Asp Glu Lys Ala Ala Ala Arg Val Asp Gln Glu Ile Asn Arg Ile Leu  
20 25 30  
Leu Glu Gln Lys Lys Gln Asp Arg Gly Glu Leu Lys Leu Leu Leu  
35 40 45  
Gly Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile  
50 55 60  
Ile His Gly  
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<210> 87  
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<213> *Saccharomyces cerevisiae*

<400> 87  
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
1 5 10 15  
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Arg Lys Leu Leu Leu Gly  
35 40 45  
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Arg Ile Leu  
50 55 60  
His Val  
65

<210> 88  
<211> 66  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 88  
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
1 5 10 15  
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Val Lys Leu Leu Leu Gly  
35 40 45  
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Lys Ile Ile  
50 55 60  
His Glu  
65

<210> 89  
<211> 66  
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<213> *Saccharomyces cerevisiae*

<400> 89  
Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
1 5 10 15  
Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Val Lys Leu Leu Leu Gly  
35 40 45  
Ala Gly Glu Ser Gly Lys Ser Thr Ile Val Lys Gln Met Lys Ile Ile  
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His Glu  
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<210> 90  
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<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 90

Met Gly Cys Thr Val Ser Thr Gln Thr Ile Gly Asp Glu Ser Asp Pro  
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Phe Leu Gln Asn Lys Arg Ala Asn Asp Val Ile Glu Gln Ser Leu Gln  
20 25 30  
Leu Glu Lys Gln Arg Asp Lys Asn Glu Leu Lys Leu Leu Leu Gly  
35 40 45  
Pro Gly Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile  
50 55 60  
His Gly  
65

<210> 91  
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<221> CDS  
<222> (1) ... (39)

<400> 91  
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Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 92  
<211> 13  
<212> PRT  
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<400> 92  
Trp His Trp Leu Gln Leu Lys Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 93  
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<221> CDS  
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<400> 93  
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Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 94  
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<212> PRT  
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<400> 94  
Trp His Trp Leu Ser Leu Ser Pro Gly Gln Pro Met Tyr

1 5 10

<210> 95  
<211> 39  
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<221> CDS  
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Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 96  
<211> 13  
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<213> *Saccharomyces cerevisiae*

<400> 96  
Trp His Trp Leu Ser Leu Asp Ala Gly Gln Pro Met Tyr  
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<210> 97  
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<400> 97  
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<210> 98  
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<400> 98  
Trp His Trp Leu Thr Leu Met Ala Gly Gln Pro Met Tyr  
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<210> 99  
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<221> CDS  
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<400> 99  
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Trp His Trp Leu Gln Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 100  
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<400> 100  
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<210> 101  
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<221> CDS  
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Trp His Trp Leu Arg Leu Gln Ser Gly Gln Pro Met Tyr  
1 5 10

<210> 102  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 102  
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1 5 10

<210> 103  
<211> 39  
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<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1) . . . (39)

<400> 103  
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Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr  
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<210> 104  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 104  
Trp His Trp Leu Arg Leu Ser Ala Gly Gln Pro Met Tyr  
1 5 10

<210> 105  
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<221> CDS  
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Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 106  
<211> 13  
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<213> *Saccharomyces cerevisiae*

<400> 106  
Trp His Trp Leu Ser Leu Val Pro Gly Gln Pro Met Tyr  
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<210> 107  
<211> 39  
<212> DNA  
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<221> CDS  
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<400> 107 39  
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Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 108  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 108  
Trp His Trp Leu Ser Leu Tyr Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 109  
<211> 39  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<221> CDS  
<222> (1) . . . (39)

<400> 109  
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Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 110  
<211> 13  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 110  
Trp His Trp Leu Arg Leu Gln Pro Gly Gln Pro Met Tyr  
1 5 10

<210> 111  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 111  
Arg Ile Asp Thr Thr Gly Ile Thr Glu Thr Glu Phe Asn Ile Gly Ser  
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Ser Lys Phe Lys Val Leu Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Ile Thr Ala Val Leu Phe Val Leu  
35 40 45  
Ala Met Ser Glu Tyr Asp Gln Met Leu Phe Glu Asp Glu Arg  
50 55 60

<210> 112  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 112  
Arg Val Leu Thr Ser Gly Ile Phe Glu Thr Lys Phe Gln Asn Asp Lys  
1 5 10 15  
Val Asn Phe His Met Phe Asp Val Gly Gly Gln Arg Asp Glu Arg Lys  
20 25 30  
Lys Trp Ile Gln Cys Phe Asn Asp Val Thr Ala Ile Ile Phe Val Val  
35 40 45  
Ala Ser Ser Ser Tyr Asn Met Val Ile Arg Glu Asp Asn Gln

50

55

60

<210> 113  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 113  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp  
1 5 10 15  
Leu His Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val  
35 40 45  
Ala Leu Ser Ala Tyr Asp Leu Val Leu Ala Asp Glu Glu Met  
50 55 60

<210> 114  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 114  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asp  
1 5 10 15  
Leu Tyr Phe Lys Met Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Gly Val Thr Ala Ile Ile Phe Cys Val  
35 40 45  
Ala Leu Ser Asp Tyr Asp Leu Val Leu Ala Glu Asp Glu Glu  
50 55 60

<210> 115  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 115  
Arg Val Lys Thr Thr Gly Ile Val Glu Thr His Phe Thr Phe Lys Asn  
1 5 10 15  
Leu His Phe Arg Leu Phe Asp Val Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Asp Val Thr Ala Ile Ile Phe Cys Asn  
35 40 45  
Ala Leu Ser Gly Tyr Asp Gln Val Leu His Glu Asp Glu Thr  
50 55 60

<210> 116  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 116  
Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Asn  
1 5 10 15  
Ile Ile Phe Lys Met Val Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val  
35 40 45  
Ala Leu Ser Glu Tyr Asp Gln Cys Leu Glu Asn Asn Gln  
50 55 60

<210> 117  
<211> 62  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 117  
Arg Met Pro Thr Thr Gly Ile Asn Glu Tyr Cys Phe Ser Val Gln Lys  
1 5 10 15  
Thr Asn Leu Lys Ile Val Asp Ala Gly Gly Gln Arg Ser Glu Arg Lys  
20 25 30  
Lys Trp Ile His Cys Phe Glu Asn Ile Ile Ala Leu Ile Tyr Leu Ala  
35 40 45  
Ser Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn  
50 55 60

<210> 118  
<211> 25  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 118  
agcttctgcc tcacgcttaa gtagc 25

<210> 119  
<211> 26  
<212> DNA  
<213> *Saccharomyces cerevisiae*

<400> 119  
gttgtccttc ttttcactcg agtacc 26

<210> 120  
<211> 10  
<212> PRT  
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<220>

<223> FRAGMENT

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1 5 10

<210> 121  
<211> 8  
<212> PRT  
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<220>  
<223> FRAGMENT

<400> 121  
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<210> 122  
<211> 8  
<212> PRT  
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<220>  
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1 5

<210> 123  
<211> 9  
<212> PRT  
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<220>  
<223> FRAGMENT

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1 5

<210> 124  
<211> 5  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 124  
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1 5

<210> 125  
<211> 7

<212> PRT  
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<220>  
<223> FRAGMENT

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1 5

<210> 126  
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<212> DNA  
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ctagtaggc 69